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EXAMINER

MEW, KEVIN D

ART UNIT PAPER NUMBER

2664

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/599,000

Applicant(s)

DAVIS, ARLIN R.

Examiner

Kevin Mew

Art Unit

2664

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-14 and 17-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-14 and 17-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Response to Amendment

1. Applicant's Arguments/Remarks filed on 4/27/2005 regarding claims 1-10, 12-14 and 17-33 have been considered and claims 1-10, 12-14 and 17-33 are currently pending. Claims 11, 15, 16 have been canceled by the Applicant.

Claim Objections

2. Claims 1, 6, 28, 33 are objected to because of the following informalities:

In claim 1, line 5, replace "the host" with "a host."

In claim 6, line 2, replace "the host" with "a host."

In claim 28, line 3, replace the term "he" with "the".

In claim 33, line 8, add the term "of" right after the term "each the second nodes" and also after the term "each the established VI channels."

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 5-7, 10, 13, 17, 31-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Forin et al. (USP 6,321,276).

Regarding claim 1, Forin discloses an apparatus at a node (personal computer, see element 20, Fig. 1) in a network (in a networked environment, see Fig. 1) comprising:

at least one virtual interface (VI) work queue (VI work queues, see elements 107, 108, Fig. 6) comprising descriptors to describe data to be transmitted and to describe where to store received data (VI send queue and receive queue are posted with descriptors that assist I/O requests, see col. 15, lines 37-53);

a channel adapter (VIA Network Interface Adapter, see element 100, Fig. 6) coupled to the VI work queue (VIA network Interface Adapter coupled to VI send and receive queues, see element 106, 107, 108, Fig. 6), the channel adapter (VIA Network Interface Adapter of the personal computer, see col. 6, lines 47-55 and Figs. 1 and 6) to interface a host to a switched fabric (VIA Network Interface Adapter to interface with a remote router, see col. 6, lines 47-55 and Fig. 1);

an emulation driver (VI kernel agent, see col. 15, lines 20-36 and Fig. 6) coupled to the channel adapter (VI kernel agent coupled to VIA Network Interface Adapter, see Fig. 6), the emulation driver mapping a legacy physical address (a virtual memory address) to a local physical address (a physical memory address) of a remote node of a local network (VI kernel agent translates virtual memory address to a physical memory address, see col. 18, lines 3-7), the channel adapter (VI Network Interface Adapter) mapping the local physical address of the remote node to a VI channel to communicate with the remote node (recoverable I/O request processor of the VIA Network Interface Adapter translates the physical memory address and sending the buffer data to a remote VIA Network Interface Adapter over a network, see col. 17, lines 32-51).

Regarding claim 2, Forin discloses the apparatus of claim 1 wherein the local physical address of the remote node (physical memory address) is embedded or provided within the legacy physical address (virtual memory address) of the remote node (virtual memory address is mapped to physical memory address, see col. 18, lines 3-7).

Regarding claim 5, Forin discloses the apparatus of claim 1 and further comprising a protocol stack (elements 102, 111, 110, 100, Fig. 6) coupled to the emulation driver (coupled to VI kernel agent, see Fig. 6), the protocol stack implementing a legacy protocol (the protocol stack implements an Ethernet protocol, see col. 14, lines 52-61) and mapping a network address to a legacy physical address for each of a plurality of nodes (VIA network interface adapter translates virtual memory addresses to physical memory addresses, see col. 14, lines 61-67).

Regarding claim 6, Forin discloses a node apparatus (personal computer, see col. 6, lines 47-55 and Figs. 1 and 6) comprising:

a channel adapter (a VIA Network Interface Adapter, see element 100, Fig. 6) to interface a host to a switched fabric (VIA Network Interface Adapter to interface with a remote router, see col. 6, lines 47-55 and Fig. 1);

an emulation driver (VI kernel agent, see col. 15, lines 20-36 and Fig. 6) coupled to the channel adapter (VI kernel agent coupled to VIA Network Interface Adapter, see Fig. 6), the emulation driver mapping a first physical address of a remote node (a virtual memory address) to a second physical address (a physical memory address) of the remote node (VI kernel agent translates virtual memory address to a physical memory address, see col. 18, lines 3-7), the channel adapter (VI Network Interface Adapter) mapping the second physical address of the remote node to a channel to communicate with the remote node (recoverable I/O request processor of the VIA Network Interface Adapter translates the physical memory address and sending the buffer data to a remote VIA Network Interface Adapter over a network, see col. 17, lines 32-51), wherein the second physical address (physical memory address) is embedded within the first physical address (virtual memory address; note that virtual memory address is mapped to physical memory address, see col. 18, lines 3-7).

a virtual interface (VI) work queue pair to establish a VI channel with the remote node of the local network (see elements 106, 107, 108, Fig. 6), wherein the work queue pair (VI work queues, see elements 107, 108, Fig. 6) comprises descriptors to describe data to be transmitted and to describe where to store received data (VI send queue and receive queue are posted with descriptors that assist I/O requests, see col. 15, lines 37-53);

Regarding claim 7, Forin discloses the apparatus of claim 6 wherein first physical address comprises a legacy or global physical address (virtual memory address), and wherein the second physical address comprises a local physical address (physical memory address, see col. 18, lines 3-7).

Regarding claim 10, Forin discloses the apparatus of claim 7 wherein the local physical address (physical memory address) can be used by the node apparatus for communication with other nodes on the local network (see col. 18, lines 3-7).

Regarding claim 13, Forin discloses the apparatus of claim 6 wherein the channel adapter comprises a host channel adapter (VIA network interface adapter 100, see col. 17, lines 40-48 and Fig. 6).

Regarding claim 17, Forin discloses the apparatus of claim 6 wherein first physical address comprises a legacy or global physical address (virtual memory address), and wherein the second physical address comprises a local physical address (physical memory address, see col. 18, lines 3-7).

Regarding claim 31, Forin discloses a method of communicating a message over a channel based network comprising:

establishing a VI channel between a first node and a second node (VI channel created between a personal computer and a remote computer, see elements 20, 49, Fig. 1 and col. 15, lines 32-47);

generating a message to be sent to a second node (sending buffer data from VIA network interface adapter 100 at a personal computer to a remote network interface adapter at a remote computer), the second node including a global or legacy physical address (virtual memory address, see col. 18, lines 3-7);

mapping the global physical address of the second node to a local physical address of the second node (translating virtual memory address to physical memory address, see col. 18, lines 3-7);

mapping the local physical address of the second node to a VI channel established between the first and second nodes (translating physical memory address to a VI channel created between VIA network interface adapter 100 and a remote network interface adapter, see col. 17, lines 32-48);

sending the message to the second node over the established VI channel (processing the send request includes establishing a VI channel, see col. 17, lines 32-48).

Regarding claim 32, Forin discloses the method of claim 31 wherein the local physical address (physical memory address) is embedded in the global physical address (virtual memory address) of the second node (virtual memory address is mapped to the physical memory address, see col. 18, lines 3-7).

Regarding claim 33, Forin discloses a method of broadcasting or multicasting a message over a channel based network comprising:

establishing a virtual interface (VI) channel between a first node and each of a plurality of second nodes using a work queue pair (establishing a VI channel between a personal computer and a remote computer using VIA network interface adapter and send/receive work queues, see col. 17, lines 32-48 and Fig. 6), wherein the work queue pair (pair of send/receive work queue, see elements 107, 108, Fig. 6) comprises descriptors to describe data to be transmitted and to describe where to store received data (VI send queue and receive queue are posted with descriptors that assist I/O requests, see col. 15, lines 37-53);

generating a message to be sent (send operation, see col. 17, lines 32-48);

sending the message from the first node to each of the second nodes via each the established VI channels (sending the buffer data from a personal computer to a remote computer via a VI channel established between VIA network interface adapter 100 and a remote VIA network interface adapter, see col. 17, lines 32-48).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 4, 8, 9, 18, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forin et al. (USP 6,321,276).

Regarding claim 3, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 3 above, except fails to explicitly show the apparatus of claim 1 wherein the legacy physical address comprises a MAC address for use in an existing or legacy network. However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-61). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using Ethernet MAC addressing scheme.

Regarding claim 4, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 3 above, except fails to explicitly show apparatus of claim 1 wherein the legacy physical address comprises a IEEE 802.3 Ethernet MAC address. However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-

61). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an IEEE 802.3 Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using the standard IEEE 802.3 Ethernet MAC addressing scheme.

Regarding claim 8, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 7 above, except fails to explicitly show the apparatus of claim 1 wherein the legacy physical address comprises a MAC address for use in an existing or legacy network. However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-61). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using Ethernet MAC addressing scheme.

Regarding claim 9, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 7 above, except fails to explicitly show apparatus of claim 1 wherein the legacy physical address comprises a IEEE 802.3 Ethernet MAC address. However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-

61). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an IEEE 802.3 Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using the standard IEEE 802.3 Ethernet MAC addressing scheme.

Regarding claim 18, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 17 above, except fails to explicitly show the apparatus of claim 17 wherein the legacy physical address comprises a MAC address for use in an existing or legacy network. However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-61). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using Ethernet MAC addressing scheme.

Regarding claim 19, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 17 above, except fails to explicitly show apparatus of claim 17 wherein the legacy physical address comprises a IEEE 802.3 Ethernet MAC address. However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-

61). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an IEEE 802.3 Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using the standard IEEE 802.3 Ethernet MAC addressing scheme.

5. Claims 12, 14, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forin et al. (USP 6,321,276) in view of Regnier et al. (US Publication 2005/0058147).

Regarding claim 12, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 6 above, except fails to explicitly show the apparatus of claim 6 wherein the channel adapter comprises an ATM NIC for interfacing to an ATM network. However, Regnier discloses a method for providing data movement between endpoints connected by multiple VI channels (see paragraph 0023) and that ATM network can be used as the data network between endpoints (see paragraph 0012). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of connecting a source node and a remote node via an ATM network such that the VIA network interface adapter would be a ATM NIC. The motivation to do is to interface the VI Network Interface Adapter with other networks such as ATM if an ATM network is being used.

Regarding claims 14, 20, Forin discloses a method comprising:

using a work queue pair (send queue and receive queue, see elements 107, 108, Fig. 6) to establish a connection-oriented VI channel (see send/receive work queue pair in VI interface 106, Fig. 6) in a network (see elements 106, 107, 108, Fig. 6) wherein the work queue pair (VI work queues, see elements 107, 108, Fig. 6) comprises descriptors to describe data to be transmitted and to describe where to store received data (VI send queue and receive queue are posted with descriptors that assist I/O requests, see col. 15, lines 37-53);

Forin determines a first physical address (virtual memory address) to a second physical address (physical memory address) correspondence for the node in the network, wherein the second physical address is embedded or provided within the first physical address (physical memory address is mapped to physical memory address, see col. 18, lines 3-7).

Forin does not explicitly show using a single ARP protocol over the network to determine a first physical address to a network address correspondence for a node of the network.

However, Regnier discloses a method for providing data movement between endpoints connected by multiple VI channels (see paragraph 0023) and that data movement between endpoints is provided via IP protocol (see paragraph 0031). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of connecting nodes using TCP/IP protocol in Regnier such that the IP network address of a remote computer can be determined. The motivation to do so is to obtain the destination IP network address of a remote computer in order to transport data from a source to the destined location at the remote computer.

Response to Arguments

6. Applicant's arguments with respect to claims 1-10, 12-14 and 17-33 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

7. Claims 21-26, 27-30 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

In claim 21, a method comprising:

obtaining a local physical address for a first node of a network;

obtaining a legacy or global physical address for the first node based on the local physical address of the first node;

obtaining a local physical address for one or more other nodes in the network;

establishing a connection-oriented virtual interface (VI) channel between the first node and each of the one or more other nodes in the network based on local physical addresses of the other nodes using a work queue pair, wherein the work queue pair comprises descriptors to describe data to be transmitted and to describe where to store received data;

using a legacy protocol to broadcast a request message over each of the established VI channels to obtain a network address of the first node.

In claim 27, a method comprising:

establishing a virtual interface (VI) channel between a first node and each of a plurality of other nodes in the network using a work queue pair, wherein the work queue pair comprises descriptors to describe data to be transmitted and to describe where to store received data;

using a legacy protocol to broadcast a request message over the VI channels including a network address;

receiving a response message including a global or legacy physical address corresponding to the network address;

determining a local physical address corresponding to the legacy physical address based on the legacy physical address without use of a specialized address request protocol.

Conclusion

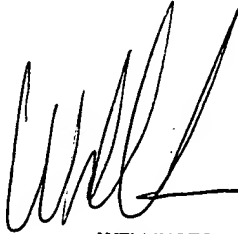
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 6,856,619 to Haugseth et al.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


WELLINGTON CHIN
SENIOR PATENT EXAMINER